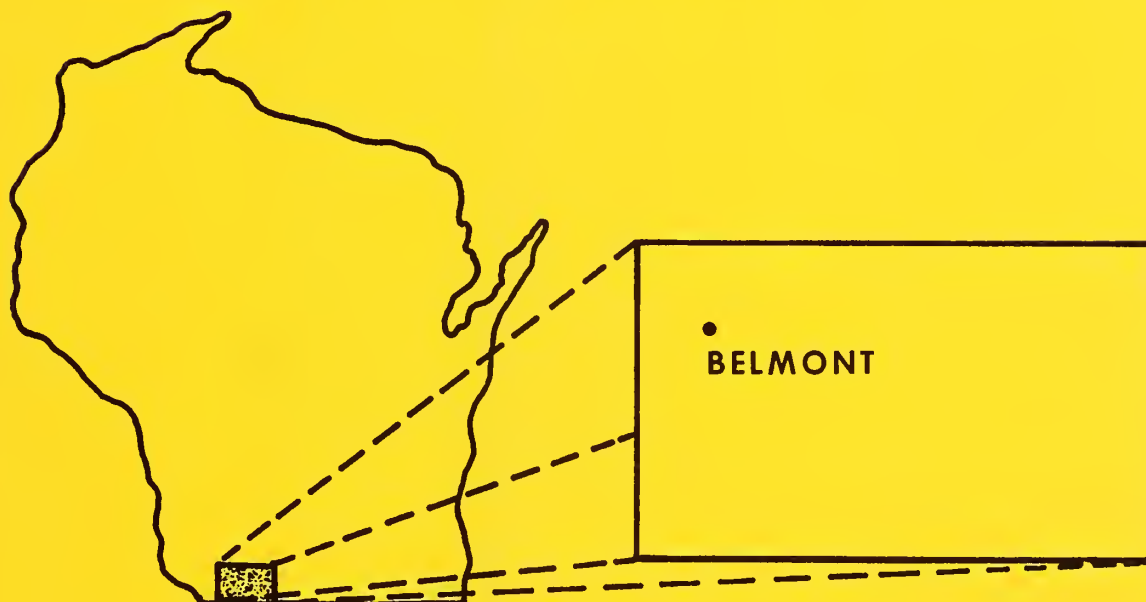


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FLOOD HAZARD ANALYSES BONNER BRANCH OF THE PECATONICA RIVER Belmont, Wisconsin



Prepared for the
VILLAGE OF BELMONT
LAFAYETTE COUNTY SOIL AND WATER CONSERVATION DISTRICT
and the
WISCONSIN DEPARTMENT OF NATURAL RESOURCES

By the
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
MADISON, WISCONSIN

OCTOBER 1973



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FLOOD HAZARD ANALYSES
VILLAGE OF BELMONT
LAFAYETTE COUNTY, WISCONSIN

APR 27 1975

Prepared by
United States Department of Agriculture
Soil Conservation Service
o Madison, Wisconsin

In cooperation with the
Village of Belmont
Lafayette County Soil and Water Conservation District
and the
✓ Wisconsin Department of Natural Resources //

October 1973

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Village of Belmont, Wisconsin

FLOOD HAZARD ANALYSES

Introduction

This report identifies flood prone areas within and near the Village of Belmont, Wisconsin. The purpose of this report is to provide technical information that will assist state and local officials in carrying out their flood plain management program.

The study was performed by the Soil Conservation Service, U.S. Department of Agriculture, with the assistance and cooperation of the Wisconsin Department of Natural Resources, the Lafayette County Soil and Water Conservation District, and the Village of Belmont. The study was requested through the Lafayette County Soil and Water Conservation District. The Soil Conservation Service carried out the study in accordance with Recommendation 9(c) of House Document No. 465, 89th Congress, under the authority of Section 6 of Public Law 83-566 and Executive Order 11296 (August 1966).

The Wisconsin Water Resources Act (Chapter 614, Laws of Wisconsin, 1965) provides for joint state-local action to protect human life and health, and to minimize future flood damages. Counties, cities, and villages have been given the responsibility to enact, administer, and enforce reasonable and effective flood plain zoning ordinances. State responsibilities, through the Division of Environmental

Protection, include the establishment and upgrading of minimum statewide standards for flood plain regulations. Minimum standards adopted by the state require flood plain delineation and associated flood plain regulations to be based on the States' "Regional Flood".

The Regional Flood is a flood determined by the Division of Environmental Protection which is representative of large floods known to have occurred generally in Wisconsin. The Regional Flood is reasonably characteristic of potential floods on a particular stream. This flood generally will have a frequency of occurrence in the order of once in 100 years. A 100-year frequency flood has a one percent chance of being equalled or exceeded in any given year.

The 100-year frequency flood discharges and elevations described should not be considered as the most severe that can occur in the study area. It is almost certain that at some future date larger floods will be experienced. It is also possible for debris and ice to block bridges and cause flood stages higher than those produced by the 100-year frequency flood.

Description of the Study Area

Belmont is located in Lafayette County, in southwestern Wisconsin. The 1970 population of the village was approximately 700. Bonner Branch of the Pecatonica River and an unnamed tributary to Bonner Branch flow through Belmont. This report covers Bonner Branch from

a point approximately 3,200 feet below the downstream village limits to the C.M. St. P. and P. Railroad crossing approximately 3,200 feet above the upstream village limits. The unnamed tributary was studied from its junction with Bonner Branch to the point where it crosses Highway 151.

The drainage area at the lower end of the study area is approximately 6.5 square miles. With the exception of Belmont, the entire watershed is agricultural. Approximately 20 percent is in pasture, and 60 percent is cropped, generally corn, oats and hay. Streams in the watershed are well defined and have steep slopes. Local relief is approximately 100 feet. A topographic map of the drainage area is shown in Figure 1.

Flood History

The floods of July 1950 and June 1969 are readily recalled by local residents. These and most other floods have been generated by summer thunderstorm precipitation. In 1950 many precipitation stations in the area recorded more than six inches of rain in a 24-hour period. In 1969, Darlington, a city approximately 12 miles southeast of Belmont, received 6.35 inches of rain in a four-hour period. Intense storms like these, together with the steepness of the watershed, produce flash floods that allow no time to warn residents of their impending arrival.

Flood damages in Belmont have been kept to a minimum, primarily because development to date has been outside of the flood plain. However, if future development of flood-prone areas is allowed, potential flood hazards will increase considerably.

Flood Frequencies

There are no streamflow gaging stations in the watershed. Estimates of flood discharges were established using procedures outlined in Section 4, Hydrology, National Engineering Handbook, Soil Conservation Service. Frequency was assigned on the basis of the 24-hour rainfall used to synthesize the flood. Rainfall was converted to runoff using Soil Conservation Service runoff curve number procedures. The discharges determined are shown in Table 1.

<u>Stream</u>	<u>Location</u>	<u>Estimated 100-Year Discharge (cfs)</u>	<u>Estimated 25-Year Discharge (cfs)</u>
Bonner Branch	U.S. Highway 151 Bridge	2,560	1,750
Bonner Branch	County Trunk Highway G Bridge	3,650	2,450
Unnamed Branch	U.S. Highway 151 Bridge	1,500	1,000

Flood Profiles

Flood elevations were developed, using SCS water surface profile computation procedures. Five road and bridge cross sections and 17 valley and channel cross sections were obtained by field survey and used in the computations. Three typical valley cross sections are shown in Figure 2.

Elevations of the computed 100-year flood exceed levels reached by the 1969 flood by amounts varying from zero to 1.5 feet. The plotted profile of the 100-year flood is shown in Figure 3.

Figures 4 through 7 show the levels that would be reached by the 100-year flood at various locations within the study area.

Flood Maps

The flood hazard maps of Figure 9 identify those areas that would be inundated by the present 100-year frequency flood. Elevations of the 100-year flood are shown at four-foot intervals on the map.

Flood boundaries were delineated on the flood map by interpolating between points of known elevation. If a more detailed determination of the boundary is required, it should be established by a level survey. To aid in this type of determination, a listing of bench marks is shown in Table 2. Two of these bench marks were established for this report. The location of the bench marks is shown on the flood hazard maps.

<u>Bench Mark No.</u>	<u>Elevation (feet) msl</u>	<u>Description</u>
1	1,015.9	Chiseled cross in northeast wingwall of U.S. Highway 151 bridge.
2	1,016.7	Chiseled cross in southwest wingwall at old U.S. Highway 151 bridge.
3 (U.S.G.S.)	1,005.16	Belmont, in southeast corner of town 0.2 mile east of crossroads which is at quarter corner between Sections 13 and 14, T.3N., R.1E., 31 feet south and 82 feet east from railroad crossing. Standard tablet in concrete post.

Floodwater Depth and Velocity

Depths of flow in the flood plain will reach five feet in areas near the channel for the 100-year flood. As indicated on the profile (Figure 3) portions of every road crossing of Bonner Branch would be inundated by the 100-year flood.

Computations indicate that the average velocity across the flood plain will exceed five feet per second at some locations (100-year flood). Since this is an average, the velocity in some areas may far exceed this value. Velocities exceeding three feet per second, combined with depths exceeding three feet, are considered a threat to public safety.

Additional Information

Technical documentation is on file with the Soil Conservation Service, 4601 Hammersley Road, Madison, Wisconsin 53711. Additional hydrologic and hydraulic computations considered flood events not published in this report. This information and limited technical assistance in the application of the data presented in this report can be obtained from the Soil Conservation Service.





- LEGEND**
- U.S. HIGHWAY
 - STATE AND COUNTY HIGHWAY
 - RAILROAD
 - CIVIL TOWNSHIP LINE
 - TOWNSHIP LINE
 - SECTION LINE
 - CORPORATE LIMITS
 - CEMETERY
 - STREAM
 - HYDROLOGIC BOUNDARY
 - STREAM CHANNEL STUDIED



SCALE 1000 0 1000 2000 3000 4000 FEET
SCALE 1/24,000

TOTAL DRAINAGE AREA OF THE LOWER STUDY AREA IS 6.5 SQUARE MILES

**WATERSHED MAP
BELMONT, WISCONSIN
FLOOD HAZARD ANALYSES**

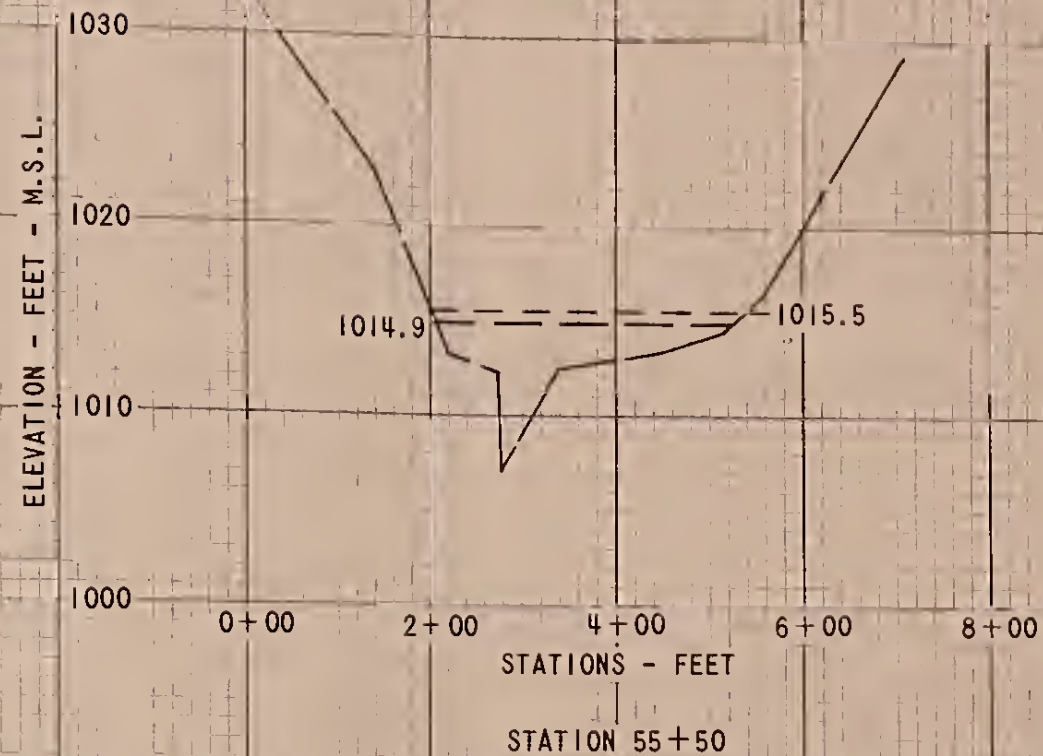
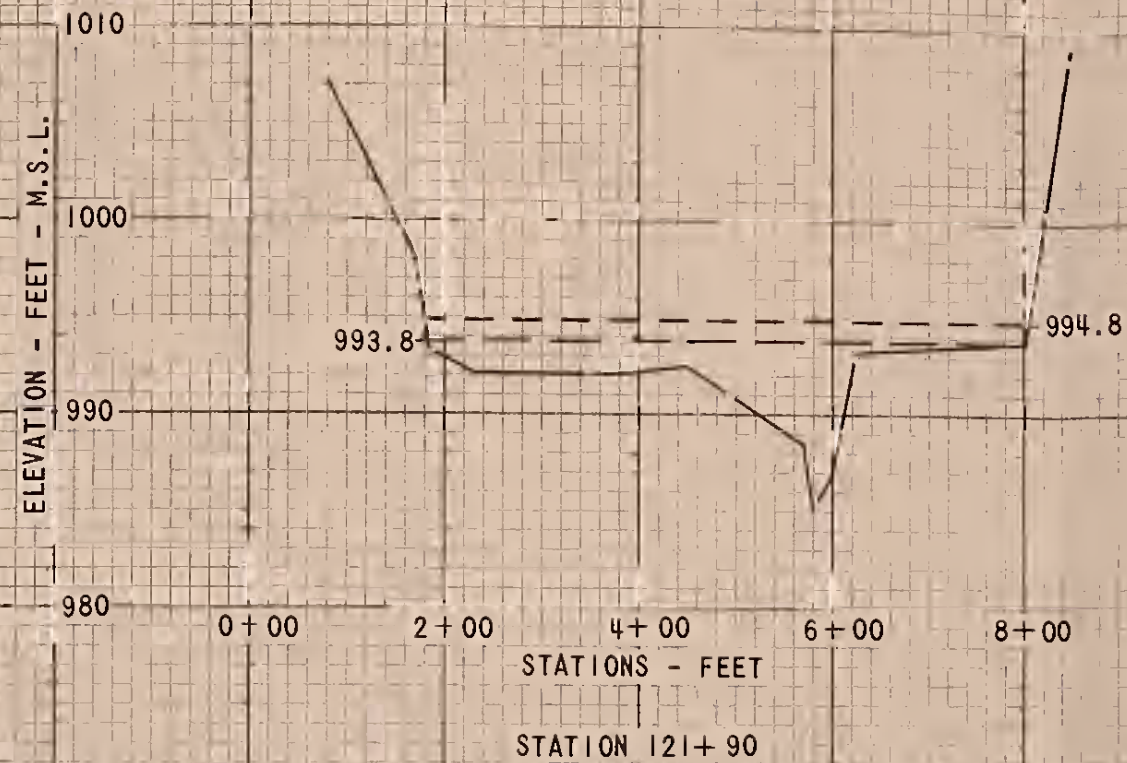
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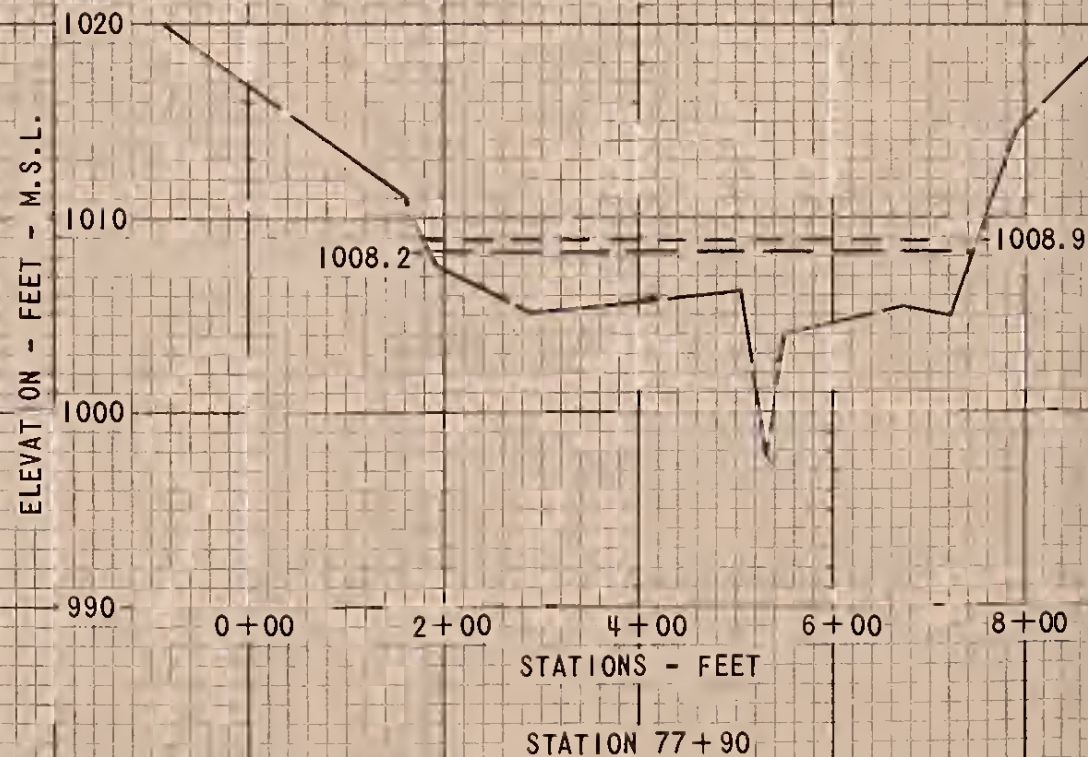
FIGURE 1

SOURCE
USGS 1/24,000 TOPO SHEETS BELMONT 1952, PLATTEVILLE 1952,
MIFFLIN 1952, REWEY 1952, WISCONSIN
USDA-NCS LINCOLN NEBR. 1972

POLYCONIC PROJECTION



NOTE: Valley sections are shown looking downstream.



LEGEND

- 100-year flood
- 25-year flood
- Ground line

VALLEY SECTIONS FLOOD HAZARD ANALYSES

BELMONT, LAFAYETTE CO., WISCONSIN

U. S. DEPARTMENT OF AGRICULTURE
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ELEVATION - FEET - M.S.L.

C. M. ST. P. & P. R.R.

Village limits

Village road

U.S. Highway 151

LEGEND

- 100-year flood
- - - 25-year flood
- - - Low bank
- . - Channel bottom
- | Bridge deck
- Low point in road
- | Low chord
- 1969 high watermark

1040

1030

1020

1010

1000

1040

1030

1020

1010

1000

0+00

10+00

20+00

30+00

40+00

50+00

60+00

STATIONS-Feet

HIGH WATER PROFILES
FLOOD HAZARD ANALYSES
BONNER BRANCH
BELMONT, LAFAYETTE CO., WISCONSIN
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

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			of 3		FIGURE 3



ELEVATION - FEET - M.S.L.

Village road

C. M. ST. P. & P. R.R.

County Highway G
Village limits

- LEGEND
- 100-year flood
 - 25-year flood
 - - - Low bank
 - . - Channel bottom
 - Bridge deck
 - Low point in road
 - Low chord
 - ⊙ 1969 high watermark

1020

1010

1000

990

980

60+00

70+00

80+00

90+00

100+00

110+00

120+00

130+00

STATIONS - FEET

HIGH WATER PROFILES
FLOOD HAZARD ANALYSES
BONNER BRANCH

BELMONT, LAFAYETTE CO., WISCONSIN

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FIGURE 3



ELEVATION - FEET - M.S.L.

U. S. Highway 151

Village road

Junction with
Bonner Branch

LEGEND

- 100-year flood
- 25-year flood
- - - Low bank
- . - Channel bottom
- | Bridge deck
- Low point in road
- | Low chord
- 1969 high watermark

1030

1020

1010

1000

1030

1020

1010

1000

0+00 A

10+00 A

20+00 A

STATIONS - FEET

HIGH WATER PROFILES
FLOOD HAZARD ANALYSES

UNNAMED TRIBUTARY
BELMONT, LAFAYETTE CO., WISCONSIN

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FIGURE 3



Figure 4

The arrow indicates the estimated 100-year flood elevation at the sewage treatment plant south of Belmont.



Figure 5

The arrow indicates the estimated 100-year flood elevation of the crossing west of U.S. Highway 151 in Belmont.



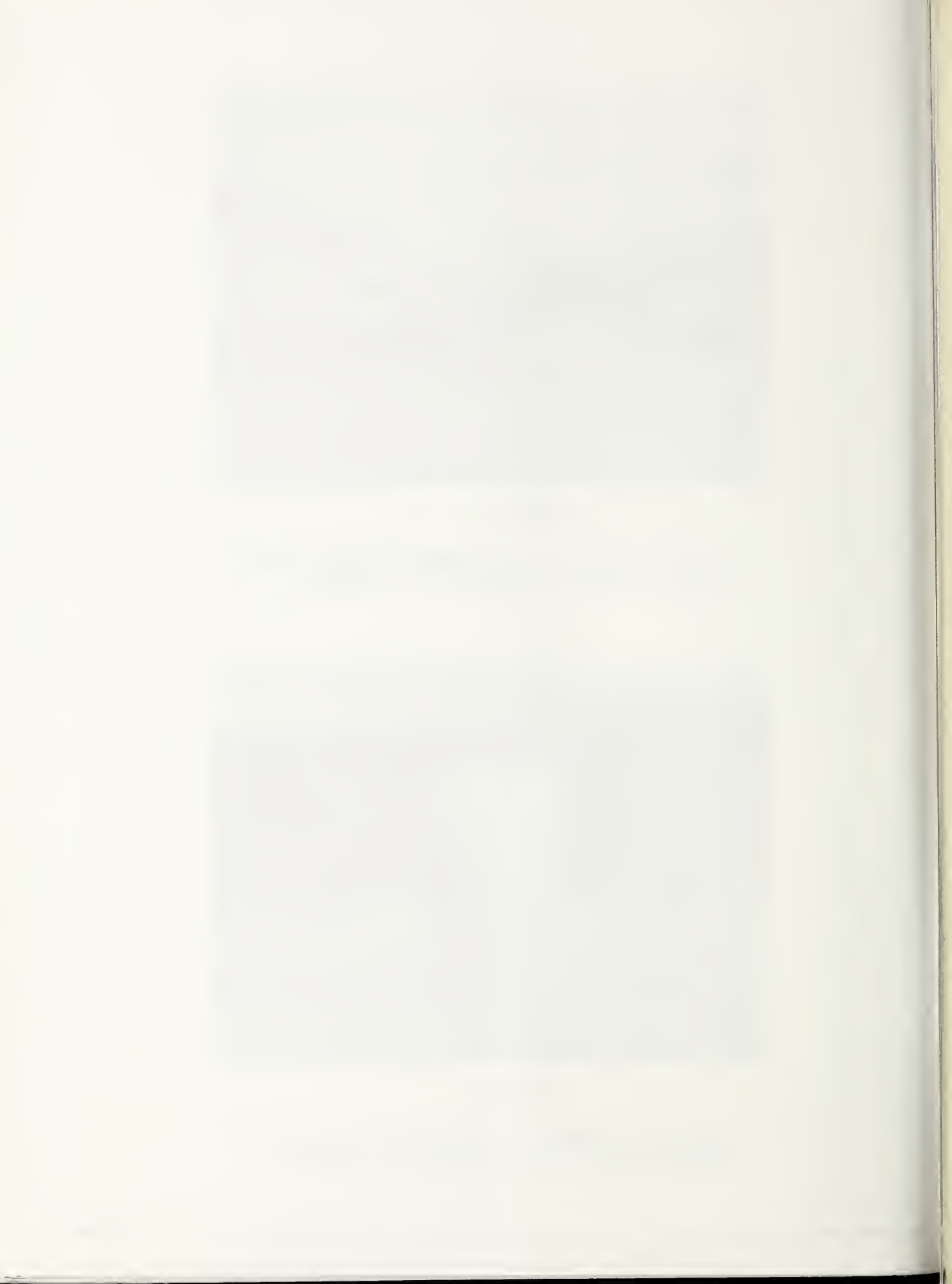
Figure 6

The arrow indicates the estimated 100-year flood elevation near U.S. Highway 151 in Belmont.



Figure 7

The arrow indicates the estimated 100-year flood elevation west of U.S. Highway 151 in Belmont.





- LEGEND**
- U.S. HIGHWAY
 - STATE AND COUNTY HIGHWAY
 - RAILROAD
 - CIVIL TOWNSHIP LINE
 - TOWNSHIP LINE
 - SECTION LINE
 - CORPORATE LIMITS
 - CEMETERY
 - STREAM
 - HYDROLOGIC BOUNDARY
 - SHEET COVERAGE



SCALE 1000 0 1000 2000 3000 4000 FEET
SCALE 1/24,000

TOTAL DRAINAGE AREA OF THE LOWER STUDY AREA IS 6.5 SQUARE MILES

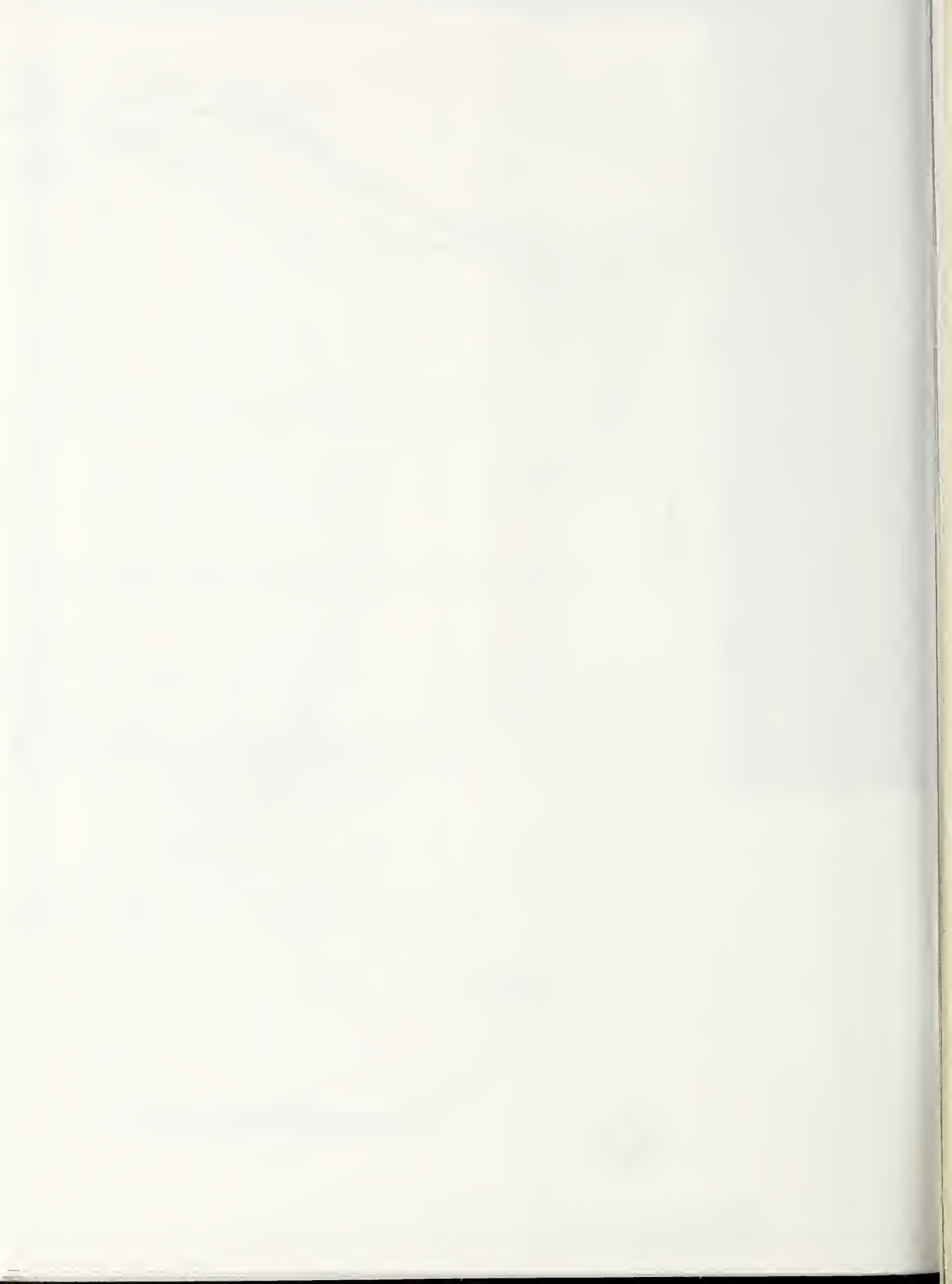
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BELMONT, WISCONSIN
FLOOD HAZARD ANALYSES

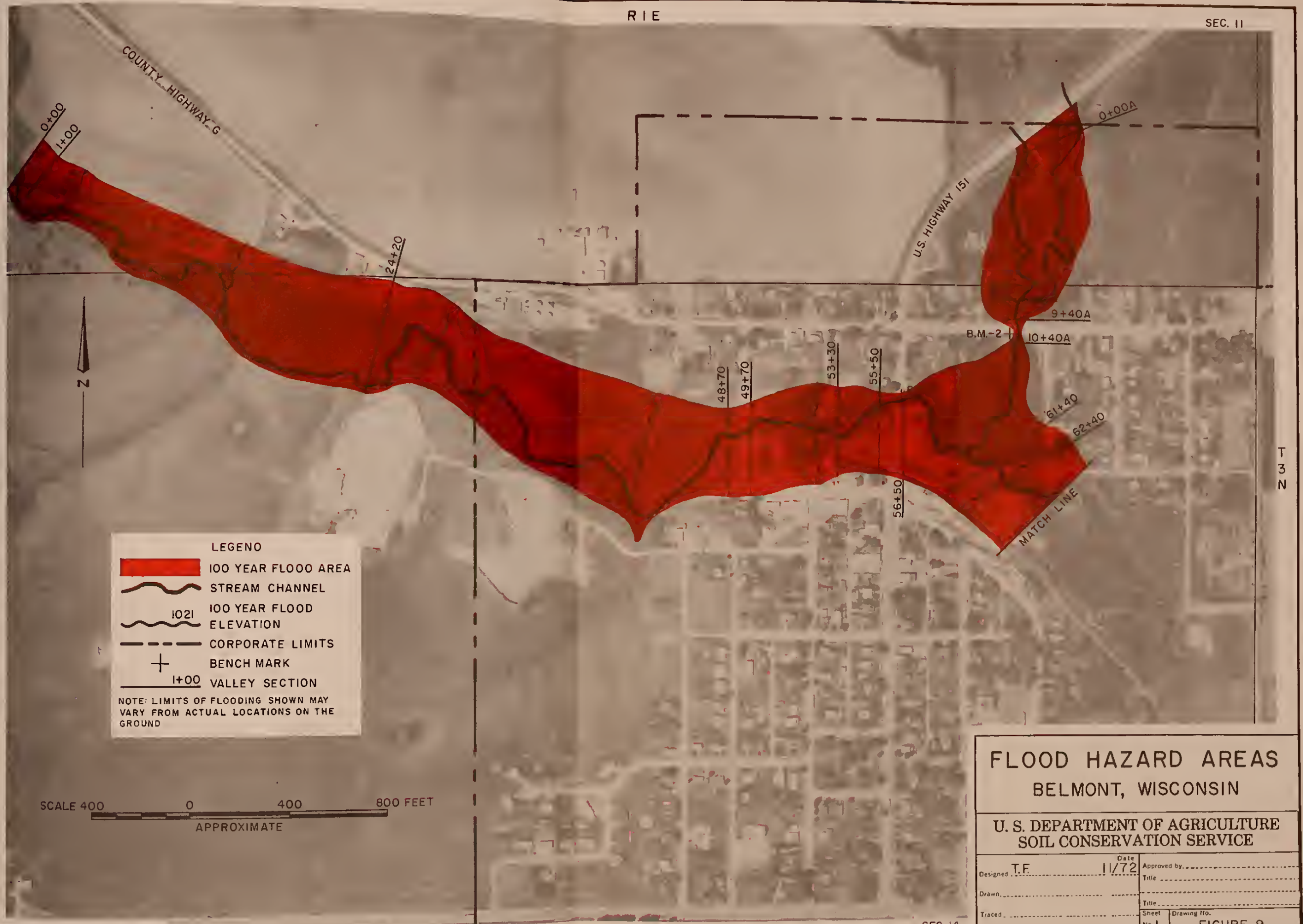
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FIGURE 8

SOURCE
USGS 1/24,000 TOPO SHEETS BELMONT 1952, PLATTEVILLE 1952,
MILWAUKEE 1952, REWEY 1952, WISCONSIN
USDA-SCS-LINCOLN, NEBR. 1977





LEGEND

100 YEAR FLOOD AREA

STREAM CHANNEL

1021 100 YEAR FLOOD ELEVATION

CORPORATE LIMITS

+ BENCH MARK

1+00 VALLEY SECTION

NOTE: LIMITS OF FLOODING SHOWN MAY VARY FROM ACTUAL LOCATIONS ON THE GROUND

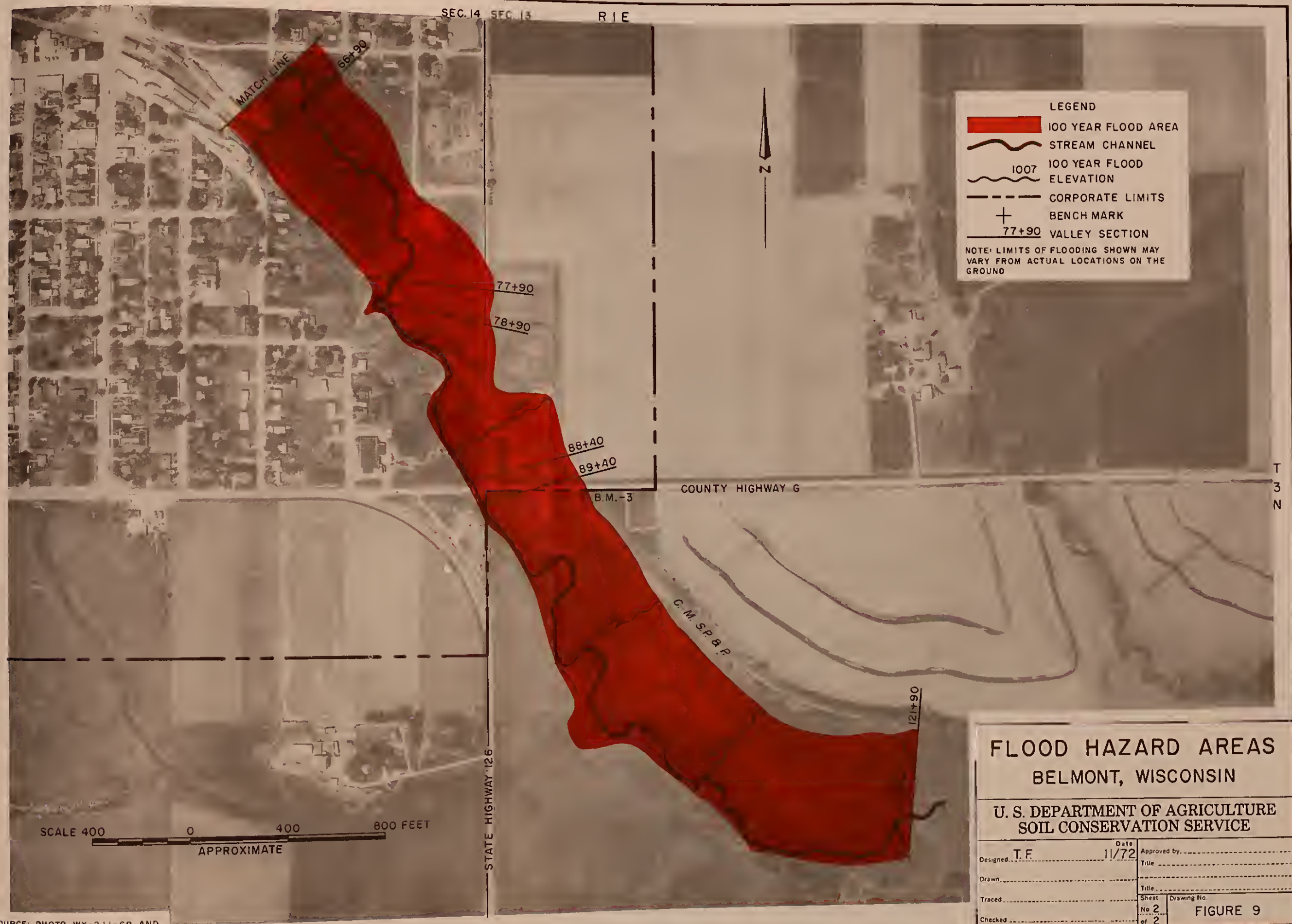
SCALE 400 0 400 800 FEET
APPROXIMATE

FLOOD HAZARD AREAS BELMONT, WISCONSIN

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Checked _____	Sheet <u>No 1</u> of <u>2</u>	Drawing No. <u>FIGURE 9</u>





LEGEND

- 100 YEAR FLOOD AREA
- STREAM CHANNEL
- 1007 100 YEAR FLOOD ELEVATION
- CORPORATE LIMITS
- BENCH MARK
- 77+90 VALLEY SECTION

NOTE: LIMITS OF FLOODING SHOWN MAY VARY FROM ACTUAL LOCATIONS ON THE GROUND

FLOOD HAZARD AREAS BELMONT, WISCONSIN

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SOIL CONSERVATION SERVICE

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				of 2	

FIGURE 9

SOURCE: PHOTO WY-2JJ-69 AND
INFORMATION FROM FIELD
USDA-SCS-LINCOLN, NEBR. 1973

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